

IN THE CLAIMS

Applicants are amending the claims so that, after amendment, they will read as set forth in the clean version of the claims which appears below. For the convenience of the Examiner, all of the pending claims are set forth below, whether amended or not. Further, the claims are set forth in logical order, rather than in numerical order. Enclosed with this Amendment is a marked-up version of the amended claims, showing in bold type the changes which have been made to the claims by this Amendment.

7. An apparatus, comprising:

a housing having a chamber therein;

a heat absorbing material disposed within said chamber in said housing; and

a heat pipe disposed within said housing and operative to facilitate heat distribution within said heat absorbing material;

including a plurality of further heat pipes;

wherein said housing includes a plurality of thermally conductive ribs extending within said chamber and each having therein an opening;

wherein each said opening has therein a respective one of said heat pipes;

wherein said chamber includes a plurality of portions which are substantially separated from each other by said ribs, and

wherein said chamber includes a plurality of channels which are provided in said housing and which facilitate fluid communication between said portions of said chamber.

8. An apparatus according to Claim 7, wherein said housing includes a thermally conductive first part having a plurality of recesses provided in one side thereof, each said portion of said chamber being in a respective one of said recesses; wherein said ribs are portions of said first part which are disposed between said recesses; wherein said housing further includes a thermally conductive second part which is disposed against said one side of said first part; and wherein said channels are each a transverse groove provided in a respective said rib on a side thereof adjacent said second part.

9. An apparatus according to Claim 7, wherein said ribs extend radially in respective different directions; wherein said openings in said ribs extend radially; and wherein said portions of said chamber are each sector-shaped, and are each disposed between a respective pair of said ribs.

10. An apparatus according to Claim 7, including an expansion accumulator which is in fluid communication with said chamber, which receives a portion of said heat absorbing material from said chamber when said heat absorbing material expands in response to an increase in temperature, and which returns said portion of said heat absorbing material to said chamber when said heat absorbing material contracts in response to a decrease in temperature.

11. An apparatus according to Claim 7, including in each said portion of said chamber a thermally conductive member made of a porous material.

12. An apparatus according to Claim 11, wherein said housing and said thermally conductive members are all made of

a metal, and wherein said thermally conductive members are each brazed to surfaces of said housing which define said chamber.

19. An apparatus according to Claim 11, wherein said heat absorbing material is a phase change material.

20. An apparatus according to Claim 7, including an antenna system which is coupled to said housing and which generates heat that is transferred to said housing.

21. An apparatus according to Claim 7, wherein said heat absorbing material is a phase change material.

22. An apparatus according to Claim 7, wherein each said opening has a first end which communicates through a passageway in said housing with a location external to said housing.

23. An apparatus according to Claim 22, wherein each said opening has a second end which is remote from said first end and which opens outwardly through an outer surface of said housing.

1. An apparatus, comprising:

a housing having a chamber therein, and having thereon an exterior surface through which heat can enter and leave said housing;

a heat absorbing material disposed within said chamber in said housing; and

a heat pipe disposed within the material of said housing and operative to facilitate heat distribution within the

material of said housing in a manner which reduces temperature gradients across said surface.

2. An apparatus according to Claim 1, wherein said heat absorbing material is a phase change material.

3. An apparatus according to Claim 1, wherein said housing has a thermally conductive portion with an opening therein, said opening being free of communication with said chamber, and wherein said heat pipe is disposed within said opening in said thermally conductive portion.

4. An apparatus according to Claim 1, including a plurality of further heat pipes; wherein said housing includes a plurality of thermally conductive ribs extending within said chamber and each having therein an opening; and wherein each said opening has therein a respective one of said heat pipes, said further heat pipes each facilitating heat distribution within said housing in a manner which reduces temperature gradients across said surface.

5. An apparatus according to Claim 4, wherein each said opening has a first end which communicates through a passageway in said housing with a location external to said housing.

6. An apparatus according to Claim 5, wherein each said opening has a second end which is remote from said first end and which opens outwardly through an outer surface of said housing.

13. An apparatus according to Claim 1, including an antenna system which engages said surface on said housing and

which generates heat that is transferred through said surface to said housing.

24. An apparatus according to Claim 1, including in said chamber within said heat absorbing material a thermally conductive member made of a porous material.

25. An apparatus according to Claim 24, wherein said housing and said thermally conductive member are made of a metal, and wherein said thermally conductive member is brazed to surfaces of said housing which define said chamber.

26. An apparatus according to Claim 24, wherein said heat absorbing material is a phase change material.

14. (Twice Amended) A method of cooling, comprising the steps of:

transferring heat to a housing through an exterior surface on said housing, said housing having therein a chamber that contains a heat absorbing material;

31
distributing said heat within the material of said housing in a manner which reduces temperature gradients across said surface, including the step of using a heat pipe disposed within the material of said housing to facilitate said distributing of said heat within the material of said housing; and

causing said heat absorbing material to absorb said heat.

15. A method according to Claim 14, including the step of using a phase change material as said heat absorbing material.

16. A method according to Claim 15, including the step of providing within said chamber a porous material which is thermally conductive, and which is in contact with said heat absorbing material.

17. A method according to Claim 14, wherein said step of distributing said heat so as to reduce temperature gradients is carried out using a plurality of heat pipes.

18. A method according to Claim 17, wherein said step of distributing said heat includes the steps of providing said housing with a plurality of ribs which are thermally conductive and each extend within said chamber, and providing a respective said heat pipe within each of said ribs.

27. (New) An apparatus, comprising:

a housing having a chamber therein, and having thereon an exterior surface through which heat can enter and leave said housing;

B2
a heat absorbing material disposed within said chamber in said housing; and

means for distributing heat within the material of said housing in a manner which reduces temperature gradients across said surface, said means including a heat pipe disposed within the material of said housing.

28. (New) An apparatus according to Claim 27, wherein said heat absorbing material is a phase change material.

29. (New) An apparatus according to Claim 27, wherein said means includes said housing having a thermally conductive portion with an opening therein, said opening being free of communication with said chamber, and wherein said heat pipe is

disposed within said opening in said thermally conductive portion.

30. (New) An apparatus according to Claim 27, wherein said means includes a plurality of further heat pipes, and includes said housing having a plurality of thermally conductive ribs which each extend within said chamber and which each have therein an opening; and wherein each said opening has therein a respective one of said heat pipes.

31. (New) An apparatus according to Claim 30, wherein each said opening has a first end which communicates through a passageway in said housing with a location external to said housing.

B2
32. (New) An apparatus according to Claim 31, wherein each said opening has a second end which is remote from said first end and which opens outwardly through an outer surface of said housing.

33. (New) An apparatus according to Claim 27, including an antenna system which engages said surface on said housing and which generates heat that is transferred through said surface to said housing.

34. (New) An apparatus according to Claim 27, including in said chamber within said heat absorbing material a thermally conductive member made of a porous material.

35. (New) An apparatus according to Claim 34, wherein said housing and said thermally conductive member are made of a metal, and wherein said thermally conductive member is brazed to surfaces of said housing which define said chamber.